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None

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(54) Safety gas valve with timer

(57) The valve comprises a valve block (11) having a passage (12) communicating with an inlet (13) communicating with a controlling valve of a gas tank and an outlet (14) connecting with a gas cooker. The passage contains a valve seat (121) closable by a first valve means (33) attached to a push rod (31). A settable timer (3) is operable to hold the valve means (33) open against a closing bias (37) by engagement of a base plate (36) thereof with the push rod (31). The push rod is released after a preset time to allow the valve means (33) to close with sounding of a bell (321,7). Between the inlet (13) and the first valve means (33) is a second valve means having a seat (341) closable by a loose ball (21). The ball (21) closes the seat (341) when there is a sudden reduction of pressure downstream of the second valve means e.g. due to a broken gas pipe. Release of the ball is effected by a manually operable bar (2, Fig. 4). The valve also includes a pressure gauge (4) and a pressure-regulator (5, Fig. 4).

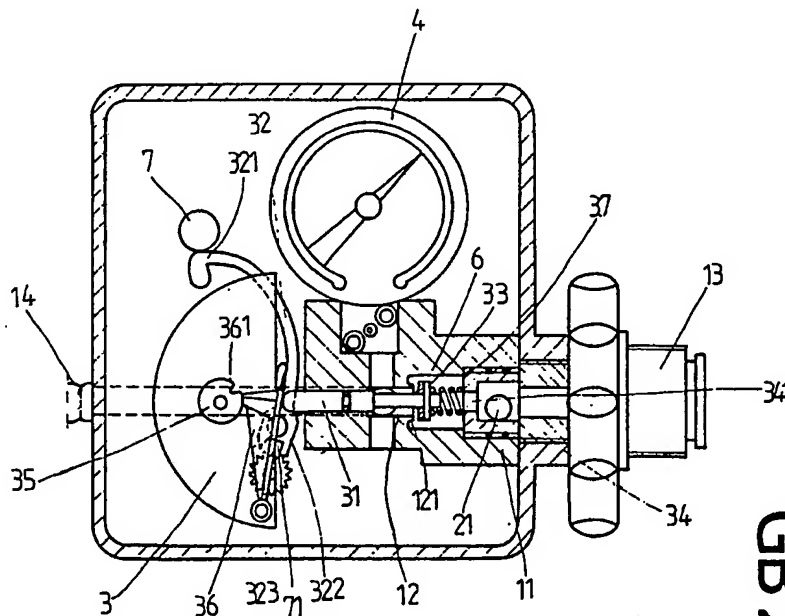


FIG. 3

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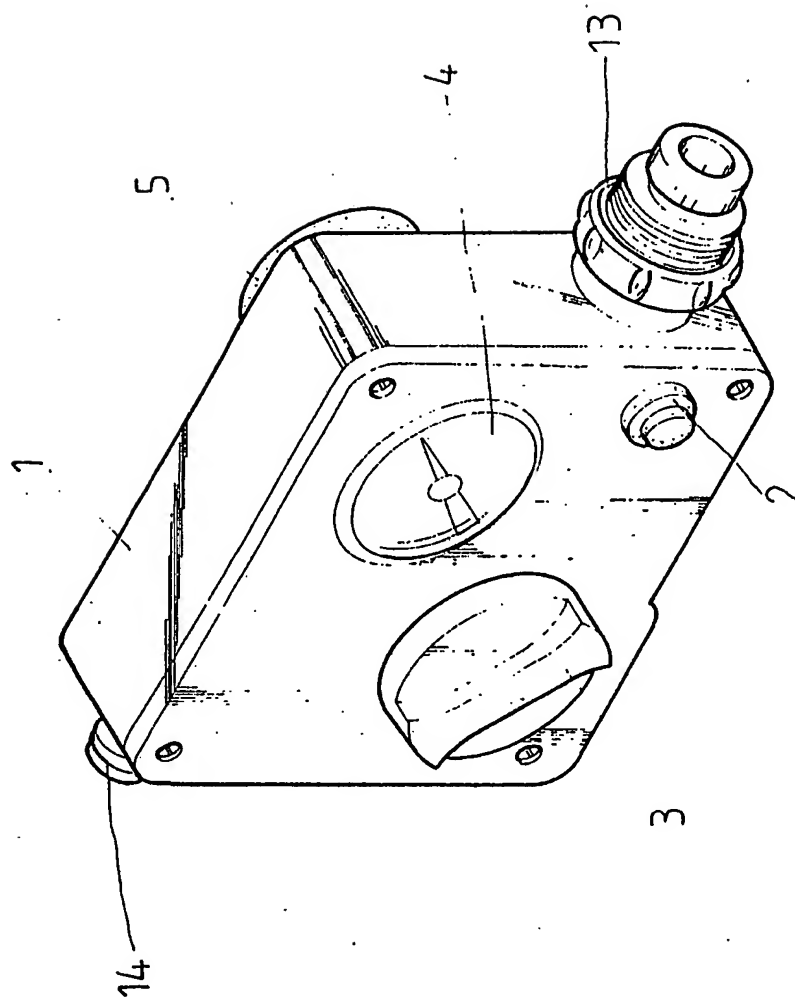
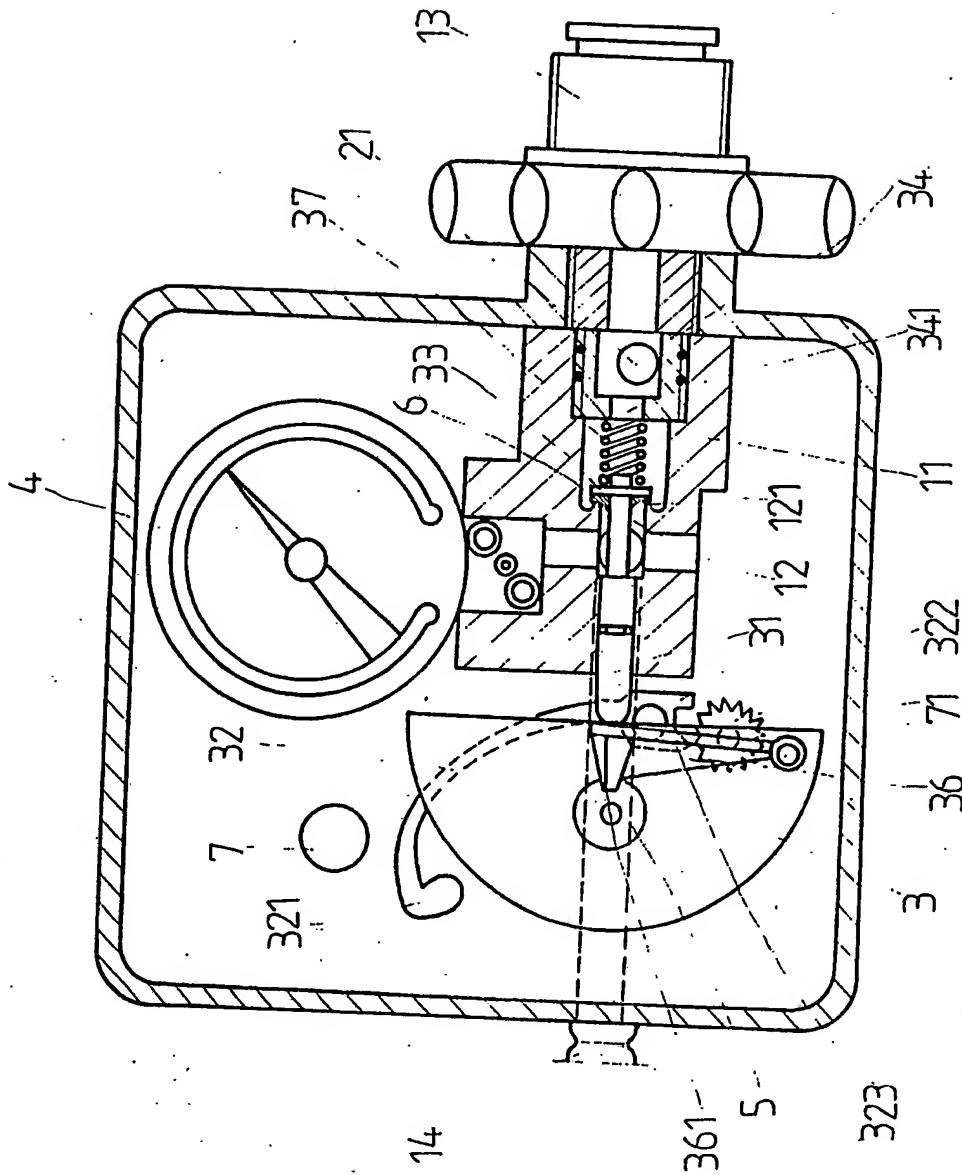


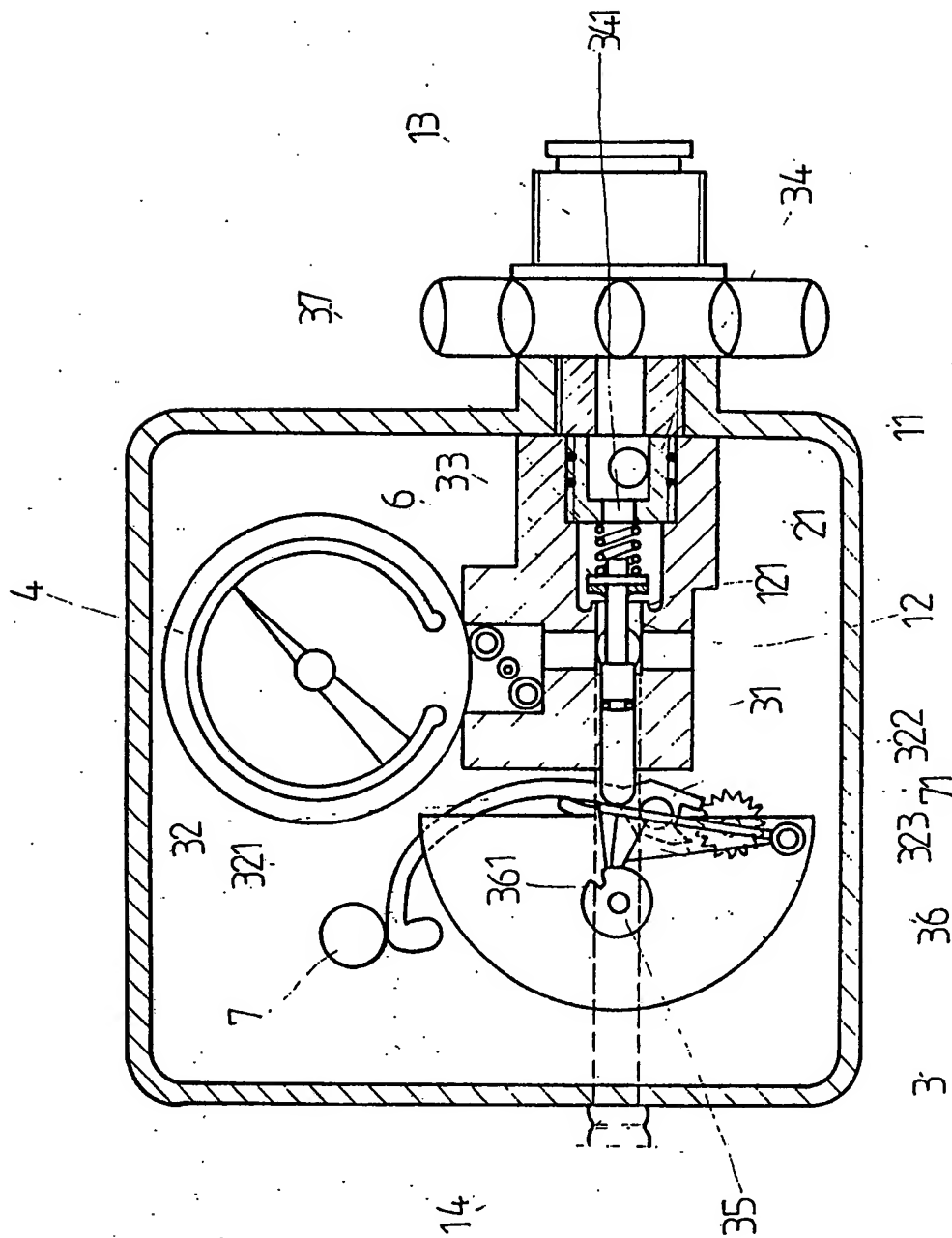
FIG. 1



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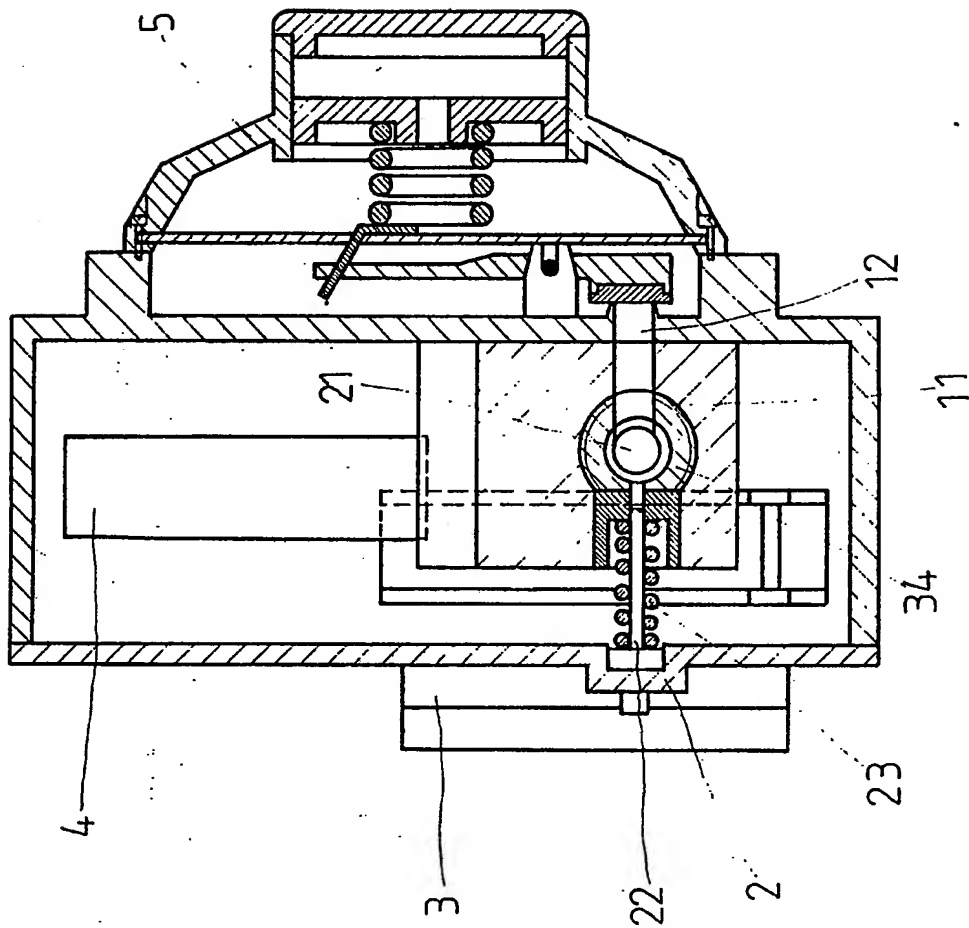


FIG. 4

SPECIFICATION

Safety gas valve with timer

- 5 This invention relates to a safety gas valve with timer.

Various types of safety valves for gas tank have been constructed in the past for controlling the gas flow passing therethrough. However, they cannot be used to measure the flow rate nor detect gas leakage. Further, they must be closed by hand thereby causing much inconvenience and wasting energy when the user forgets to close them.

- 15 It is, therefore, an object of the present invention to provide an improved safety gas valve.

It is the primary object of the present invention to provide a safety gas valve which is provided with a timer.

- 20 It is another object of the present invention to provide a safety gas valve with timer which is simple in construction.

It is still another object of the present invention to provide a safety gas valve with timer which is easy to operate.

- 25 It is still another object of the present invention to provide a safety gas valve with timer which is provided with a flow rate meter.

30 It is a further object of the present invention to provide a safety gas valve with timer which will give signals when the timer stops allowing the passage of gas.

- Other objects, merits and features of the present invention will be obtained by those having ordinary skill in the art when the following detailed description of the preferred embodiment contemplated for practicing the invention has been read in conjunction with the accompanying drawings, wherein like numerals refer to like or similar parts and in which:

Figure 1 is a perspective view of the present invention;

- 45 Figure 2 is a sectional front view of the present invention;

Figure 3 is a working view of the present invention; and

- 50 Figure 4 is a sectional side view of the present invention.

With reference to the drawings and in particular to Fig. 1 thereof, the safety gas valve with timer according to the present invention comprises a housing 1, a timer 3, a safety valve 2, a pressure gauge 4 and a pressure-regulating means 5.

- The housing 1 is provided in the interior with a block 11 having a passage 12 one end of which extends therethrough to an inlet 13 so as to communicate with a controlling valve of the gas tank (not shown). The center portion of the passage 12 extends upwardly to the pressure gauge 4. The other end of the passage 12 extends to the pressure-regulating means 5 and communicates with an outlet 14

for connecting with a gas cooker or the like via the pressure-regulating means 5.

- 70 The timer 3 is disposed at the left side of the block 11. A push rod 31 is disposed within the passage 12 of the block 11 and is in contact at its left end with a base plate 36. The other end of the push rod 31 is provided with a flange 33. The left side of the flange 33 is enclosed by a rubber packing 6 adapted to the outlet 121 of the passage. The right side of the flange 33 is enclosed by a spring 37 which bears against a stopper 34 so as to give the push rod 31 a tendency to go against the base plate 36.

- 80 The main function of the timer 3 resides in a set of gears (not shown), a notched disc 35, a base plate 36 and a knocking rod 32. When the timer 3 stops, a protuberance 361 of the base plate 361 will engage with a notch 351 of the notched disc 35 and the push rod 31 will be forced by the spring 37 to bear against the base plate 36. Meanwhile, the outlet 121 of the passage 12 will be tightly sealed by the rubber packing 6 thereby blocking the outlet of the passage 12 to the pressure-regulating means 5 and the pressure gauge 4 and therefore, preventing the gas flowing therethrough. Referring to Fig. 3, when the timer 3 is set at particular time, the circumference of the notched disc 35 will force the protuberance 361 of the base plate 36 to move rightwards which will in turn urge the push rod 31 to go rightwards. At that time, the rubber packing 6 will be separated from the outlet 121 of the passage 12, allowing gas to flow therethrough to the pressure gauge 4 and the pressure-regulating means 5. It is noted that when the timer 3 returns to its original point, the protuberance 361 of the base plate 36 will again engage with the notch 351 of the notched disc 35 (see Fig. 2).

- It should be noted that at the same time as the timer 3 is set, an output gear 71 will be driven to have a tendency to move counterclockwise. However, such tendency is limited by a lower tooth 332 of the knocking rod 32 and so the knocking rod 32 remains standstill. As the timer 3 returns to its zero point, the base plate 36 will move to the left and release the knocking rod 32. Meanwhile, the lower tooth 332 thereof will separate from the output gear 71. Hence, the output gear 71 will rotate in counterclockwise direction and force an upper tooth 323 of the knocking rod 32 to oscillate thereby causing a head portion 321 of the knocking rod 32 to hit a bell 7 and therefore, giving a warning signal.

- The main function of the safety valve 2 chiefly relies on the stopper 34, a ball 21 and a bar 22. The stopper 34 is hollow in structure, which has at its left end a center hole and opens at its right end. The ball 21 is received in the stopper 34. The bar 22 is mounted horizontally within the housing 1 and

opposite to the front end of the stopper 34 (see Fig. 4). The bar 22 is enclosed by a spring 23 and its rear end extends out of the housing 1 for being pressed by the user.

5 The safety valve 2 is used to prevent accident such as rupture of gas pipe or the like. When the gas pipe is broken, the gas flow rate will be largely increased suddenly, thereby greatly enhancing the pressure difference.

10 Thus, the ball 21 will be forced to bear against the center hole 341 of the stopper 34, resulting in the blocking of the passage 12 which connects the inlet 13 to the pressure gauge 4 and the pressure-regulating means 5 and therefore, providing high security. When the gas pipe has been repaired, it is only necessary to press the rod 22 to separate the ball 21 from the center hole 341 of the stopper 34.

20 In the meantime, since the pressure difference will return to its normal standard, the ball 21 will no longer bear against the center hole 341 of the stopper 341.

The pressure gauge 4 is mounted on the block 11. By way of the passage 12, the pressure of the gas flowing through the outlet 121 of the passage 12 will be shown in the pressure gauge 4.

The pressure-regulating means 5 is used to decrease the gas pressure of the gas tank and allow the gas to flow to the outlet 14. Since the pressure-regulating means 5 is a known part, it is unnecessary to describe the construction thereof in detail.

35 Although this invention has been described with a certain degree of particularity, it is understood that the present disclosure is made by way of example only and that numerous changes in the detail of construction and the combination and arrangement of parts may be resorted to without departing from the scope and spirit of the invention as hereinafter claimed.

45 CLAIMS

1. A safety gas valve with timer comprising a housing, a timer, a safety valve, a pressure gauge and a pressure-regulating means, characterized in that:

50 said housing being provided with a block having a passage extending therethrough, said passage having one end extending to an inlet of the housing and the other end extending to the timer, the pressure gauge and the pressure-regulating means;

55 said timer being disposed at the left side of the block end opposite to the passage, said timer having a base plate in contact with a push rod received in the passage, said push rod having a flange with a rubber packing at its left side and a spring at its right side so as to bear against a stopper thereby providing the push rod a tendency to move towards the base plate;

65 said safety valve basically comprising the

stopper, a ball and a bar, said stopper being hollow in structure with a center hole at its left end, said ball being received in the center hole and having a diameter slightly larger than that of the center hole, said bar being mounted horizontally within the housing and extending out of the housing for being pressed by the user; and

70 said gauge being mounted on the block and communicating with the passage so as to show the pressure of the gas flowing through.

2. A safety gas valve with timer as claimed in claim 1, wherein the base plate of the timer bears against the push rod so that when the base plate is moved by the notched disc, the output gear will oscillate the knocking rod to hit a bell.

3. A valve for controlling flow of gas comprising a housing having an inlet and an outlet and a gas passage therebetween, first valve means movable between an open position, in which gas can flow in the passage past the valve means, and a closed position shutting off flow past the valve means, settable timing means for closing the first valve means after a preselected time interval, normally open second valve means operable by a transient predetermined pressure drop upstream of the second valve means to shut off flow in the passage, past the first valve means when this is open, and manually operable means to release the second valve means.

4. A valve for controlling flow of a gas substantially as herein described with reference to the accompanying drawings.

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